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## Policy Implications of the Panel Report

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Topic: National Math Panel: Critical Foundations for Algebra

### Highlights

- Overview of main policy implications at the federal, state, and district/school levels
- Policy recommendations for developing state standards and assessments
- Why it's important for states to review their standards and assessments
- Policy implications for the NAEP assessment, especially related to the strand in number sense
- Important role of federal government in funding high quality research
- The need for practical research questions that have importance to teachers
- Importance of developing proficiency with fractions and the need for more research on instructional practices
- Why a cultural shift is needed in this country toward valuing mathematics and expecting that all students need to know mathematics

### About the Interviewee

Tom Loveless is a member of the National Mathematics Advisory Panel, Chair of the National Survey of Algebra I Teachers Subcommittee, and member of the Instructional Practices and Assessment Task Groups. Loveless is Director of the

Brown Center on Education Policy and Senior Fellow in Governance Studies at the Brookings Institution. Loveless researches education policy and reform. He is author of *The Tracking Wars: State Reform Meets School Policy* (1999) and editor of several books, most recently *Lessons Learned: What International Assessments Tell Us About Math Achievement* (2007). Loveless authors the annual *Brown Center Report on American Education*, a publication featuring three studies. Loveless' teaching experience includes nine years as a sixth grade teacher in California and seven years as Assistant and Associate Professor of Public Policy at the John F. Kennedy School of Government, Harvard University. Loveless received a Ph.D. in education from The University of Chicago in 1992. Loveless represents the United States in the International Association for the Evaluation of Educational Achievement and from 2006-2008 served on the President's National Mathematics Advisory Panel.

## Full Transcript

My name is Tom Loveless. I am a Senior Fellow at the Brookings Institution where I am also a Director of the Brown Center on Education Policy.

My role on the National Math Panel—I was on two of our task groups. I was on the assessment task group, and we looked at general questions involving testing in mathematics, and I was also on the instructional practices task group. The third thing that I did on the Math Panel was chair a subcommittee that surveyed teachers nationally. I think the main policy changes that need to occur that flow from the Math Panel report are in the areas of both standards and assessment. We need to get our standards and our assessment right, and that begins at the federal level but also includes the states. So we need to make sure that we have defined mathematics correctly—and the Math Panel report should help everybody do that— and then secondly, we have to make sure that we are testing the math that we want kids to learn.

So, the first thing the states need to do—and this is a state responsibility—is to review their standards. Every state has math standards, and many of the states have math standards that are so general and vague and do not stipulate what kids need to learn, that I am hoping the Math Panel will be an impetus for them to review those standards, make them more clear and tied to what we recommended in terms of content. And then the second one would be that states also examine their assessments, their tests, to see if the tests are testing that knowledge because a lot of the states are not. And the federal government needs to do the same thing.

On the assessment task group, I think the most important thing that we recommended coming out of the assessment task group was the reform of NAEP. NAEP, which is often called the Nation's Report Card in the United States, doesn't do an adequate job of assessing either algebra or those skills that the Math Panel pointed to as being essential for algebra. Currently, NAEP has a strand called number sense or number, and within that are most of the skills that the National Math Panel embraced. So, we would like to see

that strand, first of all, divided into two parts: one addressing whole numbers, the second one addressing fractions. And let's report a score every time we give NAEP on how well are kids mastering fractions at eighth grade. At eighth grade, we would have the emphasis on fractions. At fourth grade, we would have the emphasis on whole numbers. And then, let's come up with scores so that we can track progress over time with that.

The second thing the federal government can do—because this historically is an important role of the federal government—is fund more research in those critical areas that I mentioned. We just don't know enough about instruction, we need to know more. And the federal government is the right player to be funding new research in those areas—that's high-quality research that people can rely on. There is so much we don't know that we need to know, so we need to have a funder like the federal government provide money for some really hard-nosed investigations that are not romantic and not faddish but are really looking at questions of effectiveness and what works. And that needs to be started as soon as possible with good research design so that we can rely on the findings. And there is a shortage of high-quality research, so that's something that we have to improve on. And we need to be developing research questions that are practical and of value to teachers. I can give you some examples, very simple ones like, we say in the National Math Panel report that certainly by the end of fourth grade, kids need to have facility with whole numbers, whole-number arithmetic—adding, subtracting, multiplying, dividing whole numbers. There is not a huge body of research out there that tells teachers what are the most effective ways of teaching whole-number arithmetic. So, that would be one example. We also stress throughout the report the lack of knowledge of fractions in the United States—and, by the way, this is not just true of eighth graders. This is true of twelfth graders; this is true of adults in the United States. Americans just don't know fractions very well at all. I have a cartoon, I think it's in my office, where there are two guys walking along and one says, "Three quarters of American teachers don't know blah, blah, blah." And the guy walking along next to him goes, "Wow, that's almost a half."

Policymakers need to look at the research design—and unfortunately, they don't usually have much background in research design themselves—so they just don't look at that. But then, the second point is they need to make sure the effects that they want are being measured on tests that reflect the knowledge that we want kids to learn. And the third thing is a cultural shift where we need to value mathematics more; we need to consider it simply a nonnegotiable skill that kids have to have. They have to have facility with arithmetic. They have to know fractions. They have to know whole numbers. And then, ultimately, they need to take an algebra course, a good solid algebra course and a geometry course and pass them as well. So, those would be the main kind things I'd leave you with.